

June 28, 1966

N. CULTER

3,258,251

KNOCKDOWN ADJUSTABLE RAILING CONSTRUCTION

Filed Oct. 12, 1964

2 Sheets-Sheet 1

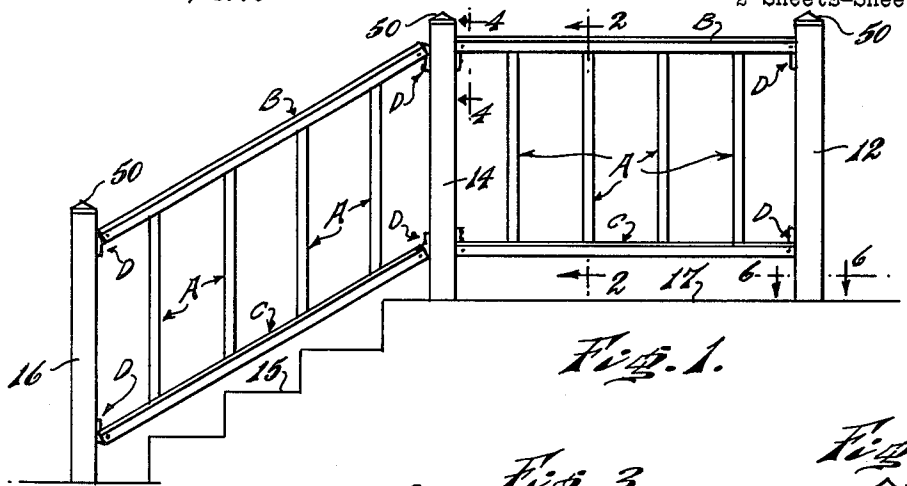


Fig. 1.

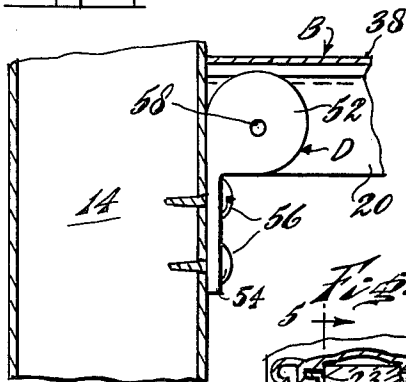


Fig. 3.

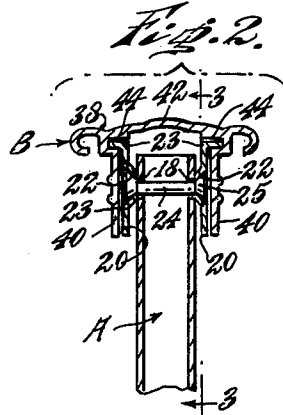


Fig. 2.

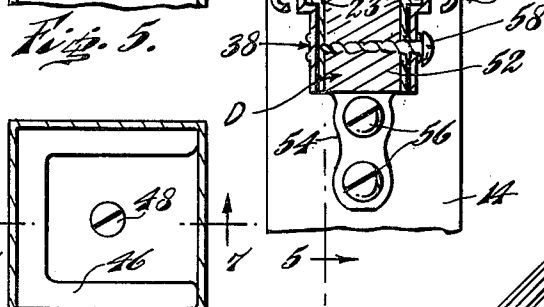


Fig. 4.

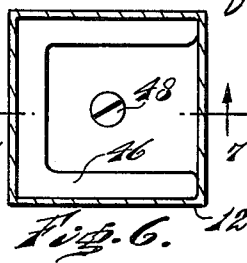


Fig. 5.

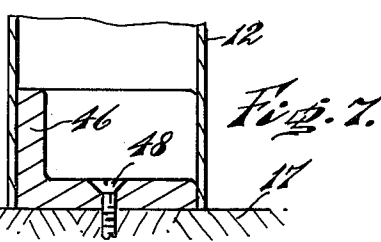


Fig. 6.

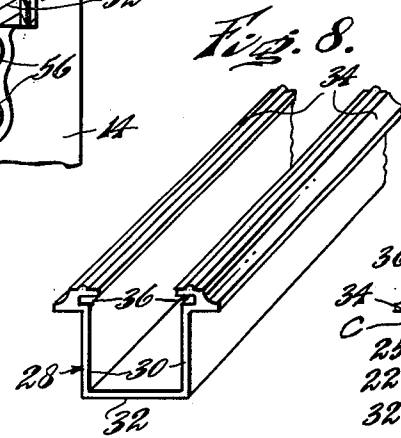


Fig. 7.

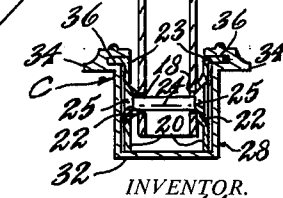


Fig. 8.

INVENTOR.
Norman Culter
BY Bilker + Moyerman.
ATTORNEYS

June 28, 1966

N. CULTER

3,258,251

KNOCKDOWN ADJUSTABLE RAILING CONSTRUCTION

Filed Oct. 12, 1964

2 Sheets-Sheet 2

Fig. 10.

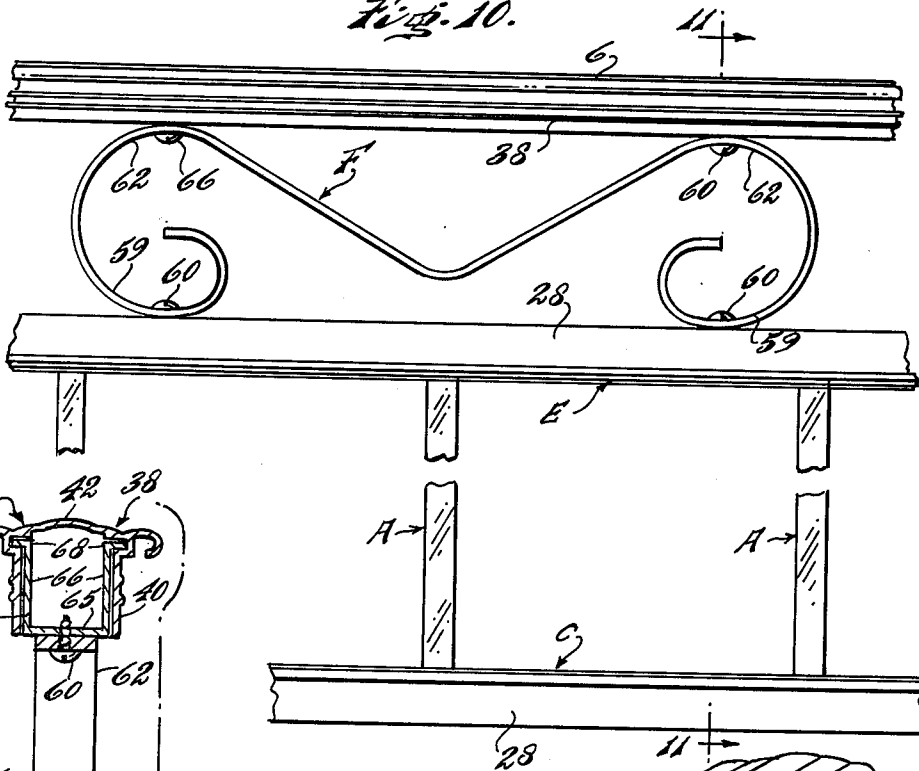


Fig. 11.

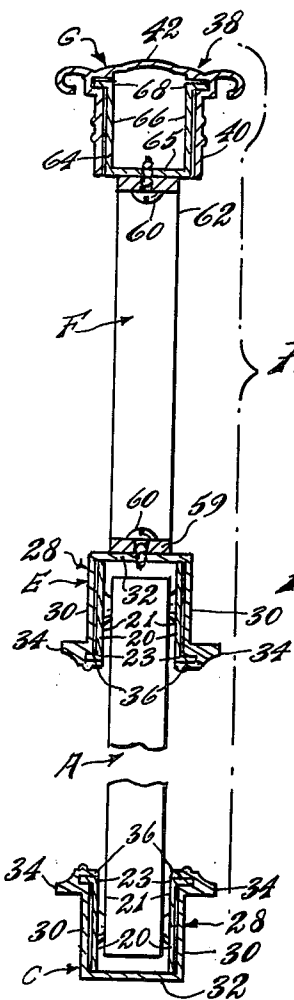
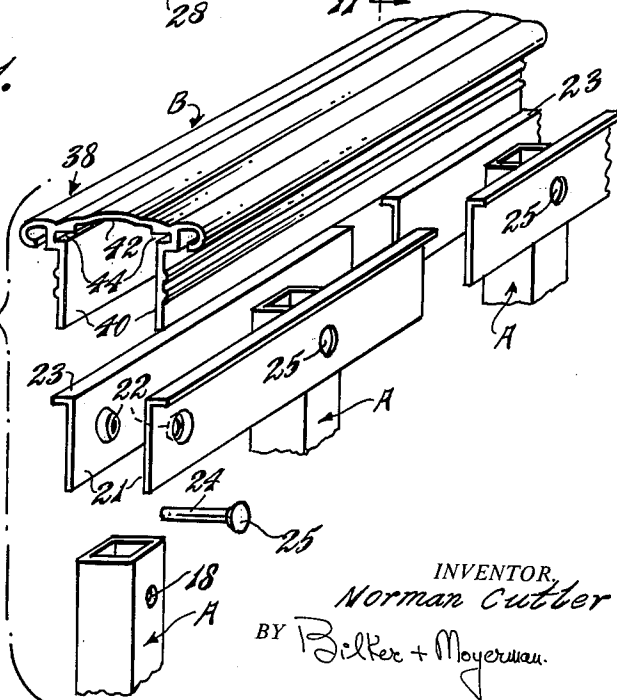


Fig. 9.



INVENTOR
Norman Culter
BY *Bilker + Moyerman.*
ATTORNEYS

1

3,258,251

KNOCKDOWN ADJUSTABLE RAILING CONSTRUCTION

Norman Culter, 400 Salisbury Road, Wyncote, Pa.

Filed Oct. 12, 1964, Ser. No. 403,100

2 Claims. (Cl. 256-22)

This invention relates to an ornamental metal railing construction, and more particularly relates to an adjustable railing, extruded from metal such as aluminum, which can be shipped in knockdown folded sections for later assembly at the site from selected lengths and there automatically oriented to accommodate for any slope of steps or pitch of ground.

In the past, ornamental railing constructions did not lend themselves to convenient shipment and handling because either the sections from which the ultimate railing was to be assembled could not be collapsed into an efficient size or the elements were so disassembled as to require an expert for erection at the site. Furthermore, the hitherto prefabricated metal railing sections were not easily adapted to allow adjustability for various angles of pitch or inclination of steps and ground contour at the erection site. Finally, these prior railing systems required so much erector hardware, such as nuts, bolts, screws, as to give them a most unsightly external appearance rather than desirable smooth, free-flowing ornamental lines.

It is therefore an object of this invention to provide a prefabricated, knockdown, ornamental metal railing construction which may be conveniently shipped in a package of small girth, and which may be readily and quickly assembled by an unskilled person at the site.

Another object of this invention is to provide an ornamental metal railing construction in which the pickets are securely fastened to the rails by concealed means, and in which there are no exposed bolts, rivets, screws or other parts to obstruct the smoothness of the erected railing.

Another object of this invention is to provide an ornamental metal railing construction which is fabricated from interchangeable fully-collapsible modular folding sections whereby the assembled railing may be adjustably pivoted to enable its erection upon variable ground inclinations or step slopes.

Still another object of this invention is to provide an ornamental railing construction in which all rail stringer elements have longitudinally slidable caps to conceal the picket pivotal connections and also to permit adjacent modular sections to be adjoined telescopically without seams.

Other objects of this invention are to provide an improved device of the character described which is easily and economically produced, which is sturdy in construction, and highly efficient and effective in operation.

With the above and related objects in view, this invention consists of details of construction and combination of parts as will be more fully understood from the following detailed description when read in conjunction with the accompanying drawings, in which:

FIGURE 1 is a side elevational view of an adjustable metal railing construction embodying this invention.

FIGURE 2 is a sectional view taken along lines 2—2 of FIGURE 1.

FIGURE 3 is a sectional view taken along lines 3—3 of FIGURE 2.

FIGURE 4 is a sectional view taken along lines 4—4 of FIGURE 1.

FIGURE 5 is a sectional view taken along lines 5—5 of FIGURE 4.

FIGURE 6 is a sectional view taken along lines 6—6 of FIGURE 1.

2

FIGURE 7 is a sectional view taken along lines 7—7 of FIGURE 6.

FIGURE 8 is a perspective view of a lower cap element embodied in this invention which is telescopically received on the bottom rail member illustrated in FIGURE 2.

FIGURE 9 is an exploded perspective view of the upper handrail cap element embodied in this invention which is telescopically received on the upper rail member illustrated in FIGURE 2.

FIGURE 10 is a fragmentary side elevational view of a modified form of this invention.

FIGURE 11 is a sectional view taken along lines 11—11 of FIGURE 10.

Referring now in greater detail to the drawings in which similar reference characters refer to similar parts, I show an adjustable knockdown railing construction comprising a plurality of pickets or spindles A which are pivotally connected at their upper and lower ends to a longitudinally-extending top rail member B and a bottom rail member C thereby defining a modular section which is free to assume any parallelogram configuration. Each modular folding section may thus be assembled at the site, as shown in FIGURE 1, intermediate vertical posts 12 and 14 to provide a horizontally extending portion above patio 17 or intermediate posts 14 and 16 to yield an inclined portion over steps 15. As is also readily apparent, each section can be prefabricated at the plant and shipped in fully collapsed position within cartons of minimal girth.

The pickets A are extruded tubular aluminum elements, preferably of rectangular cross-section, having aligned pairs of openings 18 in opposed side walls adjacent each end. In the embodiment shown in FIGURES 1 to 9, the rail members B and C include pairs of inner stringers 20 which are longitudinally-extending extruded angles of L-shaped cross-section. As best illustrated in FIGURES 2 and 9, each stringer 20 has a vertical flange portion 21 with longitudinally-spaced dimpled or countersunk holes 22 which register with the openings 18 in the side walls of the pickets A and a horizontal flange portion 23 which projects outwardly when the top and bottom ends of pickets are sandwiched between opposing stringer pairs. Rivets 24 are passed through the respective aligned openings 18 and inwardly dimpled holes 22 and have upset heads 25 which seat within the countersunk dimples so as to be substantially flush with the outer faces of the stringer vertical flanges 21. The rivets 24 thereby provide a plurality of pivot points about which the pickets A are hingedly constrained in a parallelogram linkage.

Referring now to FIGURES 2 and 8, the bottom rail member C also includes a longitudinally-extending cap 28 of generally U-shaped section which is slidably received upon the lower pair of stringers 20 so as to conceal the rivet heads 25. The cap 28 is normally of a length co-extensive with that of the stringers 20 of a prefabricated section although it may be equal to two or more sections and telescopically couple longitudinally abutting stringers and cover the abutment line. Cap member 28 is also an extruded aluminum component and comprises a pair of vertical side flanges 30 interconnected by a light web 32. The ends of the side flanges 30 have outwardly formed decorative projections 34 with interior opposed longitudinally-extending slots 36. See FIGURE 8. When the cap 28 is inserted over the lower stringers 20, the slots 36 slidably embrace the oppositely disposed horizontal flanges 23 while the side flanges 30 are guided over the outer faces of the stringers' vertical flanges 21 and encapsulate the rivet heads from view.

In a similar manner, the upper rail member B includes a handrail cap extrusion 38 of generally inverted U-shaped cross-section wherein a pair of laterally spaced flanks

40 downwardly project from a fluted baluster web 42. As is best illustrated in FIGURES 2 and 9, the handrail cap 38 has a pair of opposed interior longitudinally-extending recesses 44 which are slidably received upon the complementary outwardly-extending horizontal flanges 23 of the upper pair of stringers 20. The flanks 40 embrace the outer faces of the stringers' vertical flanges 21 to hide the pivot joints 24 from view while the baluster web portion 42 effectively conceals the upper ends of the pickets A themselves. It is also to be noted that the length of the handrail cap 38 may be co-extensive with that of the stringer 20 of a single modular section or it may be of sufficient length to support and combine two or more abutting sections without exhibiting the abutting seams. See FIGURE 9.

The posts 12, 14 and 16 are also preferably of rectangular tubular extrusions and are mounted upon complementary bases 46 which are secured to steps 15 or the patio 17 by suitable bolts 48. See FIGURES 6 and 7. Detachable end caps 50 telescopically interfit within the upper portions of the posts and may be of various ornamental configuration to suit the taste of the user. Finally, end brackets D are employed to assemble the sections of the railing to the posts.

The end brackets D comprise a cylindrical portion 52 which is received in the channel between the pairs of spaced stringers 20 at the ends of the rail members B and C and a flat tail 54 which is secured to the posts by self-threading screws 56. See FIGURES 4 and 5. Self-threading screws 58 which extend through aligned apertures in the respective rail members and the cylindrical portion 52 couple the modular sections to the brackets D and hence to the various posts. Note the modular sections are free to orient themselves about their parallelogram pivots so as to assume the angle of inclination desired.

In FIGURES 10 and 11, there is shown a modified railing construction comprising a medial rail member E and the bottom rail C between which the pickets A are pivotally supported in a parallelogram linkage, and design scroll means F affixed between the medial rail E and a top or handrail member G.

The construction of the bottom rail C is exactly the same as that described under the two-rail modular section, and the lower end of each of the pickets A is embraced by a pair of stringers 20 through the dimpled holes 22 of which the rivets 24 provided the pivotal joints. Once again, the lower cap 28 is slidably received upon the lower stringer pair to cover the rivet heads 25. However, the medial rail E, while it includes a pair of stringers 20 which sandwich the upper ends of the pickets A with pivotal rivet joints 24, the stringers 20 are now inverted so that their laterally-extending horizontal flanges 23 project from the lower portion of the vertical flanges 21. The rivet heads 25 are still recessed within the inwardly dimpled holes 22 of the vertical flanges 21, and the pivotal mounting is as before.

Instead of a handrail cap 38 being slidably received on the upper stringers 20, a second cap member 28 is employed except that the U-channel is inverted and the bight web 32 now overlies the top of the pickets A. However, the slots 36 still telescopically embrace the horizontal flanges 23, and the side flanges 30 cover the vertical flanges 21 to conceal the rivet heads 25. The bight web 32 is now adapted to support the scroll means F as will now be described.

The scroll means F generally comprises lengths of aluminum bar stock which is formed into designs of various convolutions. Such scroll work is well known in the art, but in the instant application the height at the maximal portions is retained relatively constant, perhaps six inches as an example. In the embodiment illustrated, the scroll F takes the form of a rather elaborate M whose legs 59 are curled inwardly to provide a base for support. Sheet metal screws 60 pass through

apertures in the legs 59 and threadedly engage longitudinally-spaced registering apertures in the bight web 32 of cap member 28. The screws 60 project downwardly into the space between the upper pair of stringers 20 without intruding with the tops of pickets A or their pivotal connections.

In a similar manner, the mantles 62 of the scroll F are secured by sheet metal screws 60 to the bight portion 65 of U-shaped channel member 64 through respective aligned apertures therein. The channel member 64 includes a pair of laterally-spaced sides 66 upwardly extending from the bight portion 65. Outwardly turned horizontal lips 68 are formed on the sides 66 and define horizontal tracks for slidably receiving the recesses 44 in handrail cap 38 of top handrail member G. It is to be observed that the baluster web 42 now overlies the channel member 64 and conceals the screws 60 upwardly projecting therein.

The scroll means F may either be prefabricated upon the medial cap 28 and the upper channel member 64 at the plant and then slidably incorporated as a unitary assembly over the upper stringers 20 at the site of installation, or they may be mounted individually upon the medial rail E after the lower pivotally coupled railing section is in place. As before, the three-rail modular sections, which include the scroll means F, are secured to the vertical posts 12, 14 and 16 by coupling the end brackets D to the terminals of the handrail member G, the medial rail member E and the bottom rail member C.

It is thus evident that the railing construction of the instant invention is well adapted for convenient shipment of modular sections in packages of small size, and thereafter easily assembled at the site to suit the inclination of the ground or slope of the steps. Furthermore, the telescoping cap members 28 and 38 fully conceal all seams and rivet, bolt and screw connections, which would otherwise present an unsightly appearance, so as to provide a smooth design that does not detract from the overall ornamental configuration.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting since the invention may be variously embodied and the scope of the invention is to be determined as claimed.

What is claimed is:

1. An adjustable metal railing construction comprising a plurality of extruded tubular pickets of rectangular cross-section and having registering openings in opposing side walls thereof adjacent each end; a pair of vertical end posts; an upper stringer member comprising a pair of longitudinally-extending angle members of L-shaped cross-section, each including a longitudinally-extending vertical flange, abutting a corresponding side wall of the top end portion of said pickets with longitudinally-spaced countersunk holes registering with the respective openings thereof and a longitudinally-extending horizontal flange laterally projecting at right angles from the vertical flange; a plurality of rivets extending through the respective registering openings and countersunk holes with heads substantially flush with the outer faces of the vertical flanges and providing pivots for relative hinged movement of said pickets with said upper stringer member; a lower stringer member comprising a second pair of longitudinally-extending angle members of L-shaped cross-section, each including a longitudinally-extending vertical flange abutting a corresponding side wall of the bottom end portion of said pickets with longitudinally-spaced countersunk holes registering with the respective lower openings thereof and a longitudinally-extending horizontal flange laterally projecting at right angles to the vertical flange of each of said second pair of angle members; a plurality of rivets extending through the respective registering openings in the picket bottom end portions and countersunk holes in the second pair of angle members with heads substantially flush with the outer

faces of the vertical flanges thereof and providing pivots for relative hinged movement with said lower stringer member; a lower longitudinally-extending cap member of U-shaped cross-section including a pair of vertical side flanges with interior longitudinally-extending slots and an interconnecting bight web, said cap member being slidably received on said lower stringer with the slots embracing the opposed horizontal flanges thereof and the side flanges covering the outer faces of the lower vertical flanges and co-extensive therewith so as to conceal the heads of the lower rivets from view, an upper longitudinally-extending cap member of inverted U-shaped cross-section including a pair of vertical side flanges having opposed interior longitudinally-extending slots and an interconnecting medial web, said upper cap member being slidably received on said upper stringer member with the slots embracing the opposed horizontal flanges thereof and the upper cap side flanges covering the outer faces of the upper vertical flanges so as to conceal the heads of the upper rivets from view while the medial web overlies the top end portions of said pickets; scroll means secured to the medial web and upwardly extending therefrom; a top longitudinally-extending U-shaped channel member having a bight portion secured to the upper portion of said scroll means and a pair of laterally-spaced sides upwardly extending from the bight portion, the sides having opposed longitudinally-extending outwardly-turned horizontal lips, and a longitudinally-extending handrail cap section of inverted U-shaped cross-section having a pair of laterally-spaced flanks downwardly extending from a baluster web, said flanks having opposed longitudinally-extending recesses slidably receiving the opposed lips of said channel member and embracing the sides thereof while said baluster web overlies said channel member, and means for securing the ends of said handrail cap section and said upper and lower cap members to said end posts whereby said end posts and said pickets define a pivotally adjustable parallelogram linkage to permit vertical disposition of said pickets at any pitch and further permit minimal knockdown girth of said railing construction during shipment.

2. An adjustable railing construction comprising a pair of vertical posts; longitudinally-extending upper and lower rails mounted between said posts; a plurality of parallel vertical pickets extending between said rails, said upper and lower rails each including a pair of stringer members of L-shaped angular configuration each having a vertical flange and a horizontal flange, the vertical flanges of said stringer members having longitudinally-spaced inwardly dimpled holes, said pickets having openings adjacent each end, the vertical flanges of said stringer mem-

bers abutting opposite sides of said pickets at the upper and lower ends thereof with the dimpled holes of each pair of stringer members in alignment and registering with the respective openings in said pickets, the horizontal flanges of the upper and lower pairs of stringer members being outwardly disposed; a plurality of rivets extending through registering holes and openings to provide relative pivotal movement of said pickets with said upper and lower pairs of stringer members in a hinged parallelogram linkage, and said rivets having heads recessed within the dimpled portions of said vertical flanges flush with the outer faces thereof; a lower longitudinally extending cap member of U-shaped cross-section including a pair of vertical side flanges with opposed interior longitudinally-extending slots and an interconnecting bight web, the opposed slots of said lower cap member slidably receiving the respective horizontal flanges of the lower pair of stringer members and the side flanges covering the outer faces of the vertical flanges of said last-mentioned pair of stringer members so as to conceal the heads of said lower rivets from view; a longitudinally-extending handrail cap of inverted U-shaped cross-section including a pair of laterally-spaced flanks downwardly extending from a baluster web, said flanks having interior opposed longitudinally-extending recesses slidably receiving the respective opposed horizontal flanges of the upper pair of stringer members and covering the outer faces of the vertical flanges thereof so as to conceal the heads of said upper rivets from view and said baluster web overlying and concealing the upper ends of said pickets from view; and bracket means for securing said upper and lower rails to said posts so as to enable selective adjustment of the slope of said railing construction.

References Cited by the Examiner

UNITED STATES PATENTS

1,416,957	5/1922	Hughes	256—22
2,590,929	4/1952	Bush	256—22
2,870,996	1/1959	Helt	256—22
2,932,488	4/1960	Dotson	256—22 X
3,033,532	5/1962	McFall	256—21
3,166,299	1/1965	De Chellis	256—65 X

FOREIGN PATENTS

550,485 12/1957 Canada.

HARRISON R. MOSELEY, *Primary Examiner.*

50 D. L. TAYLOR, *Assistant Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,258,251

June 28, 1966

Norman Cutler

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the drawings, Sheets 1 and 2, for "N. CULTER", each occurrence, read -- N. CUTLER --; in the heading to the printed specification, line 4, for "Norman Culter" read -- Norman Cutler --.

Signed and sealed this 24th day of January 1967.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents